

### **REMARKS**

Claims 1, 6, 8, 10, 11, 14 and 15 have been amended. Claims 4, 7 and 9 have been canceled. New claims 18-22 have been added. Thus, claims 1-3, 5, 6, 8 and 10-22 are now pending. Support for the amendment to claim 1 may be found in original claim 4. Support for the amendment to claim 14 may be found in original claims 7, 9 and 14. Support for new claim 18 may be found in original claims 1 and 2. Support for new claim 19 may be found in original claim 7, and in the specification at page 31, line 20 to page 32, line 15. Support for new claim 20 may be found in original claims 1, 2 and 15. Support for new claim 21 may be found in original claims 7 and 15, and in the specification at page 31, line 20 to page 32, line 15. Support for new minor matters can be found generally in the specification as filed. Since these amendments do not add new matter, entry thereof is respectfully requested.

#### **Claim objection**

Claim 6 was objected to because the recitation of “hydrophilic group” in line 1 did not have sufficient antecedent basis. Claim 6 as amended depends on claim 5 which recites “hydrophilic group”, thus there is now proper antecedent basis for recitation of this term in claim 6.

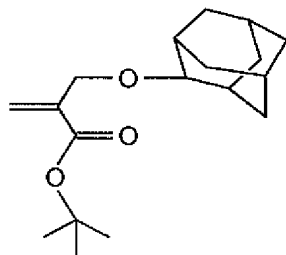
In view of the comment provided above, Applicants respectfully request reconsideration and withdrawal of the claim objection.

#### **Rejections under 35 U.S.C. §102**

##### **Yoshida et al. (US 2002/0099147)**

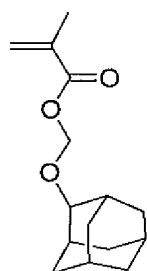
Claims 1, 2, 4, 7-10 and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshida et al. (US 2002/0099147).

In order for a claim to be anticipated by a reference, each feature of the claim must be found within the reference. Yoshida et al discloses t-butyl ( $\alpha$ -adamantyloxymethyl)acrylate (TAMA) in Example 3, the structure of which is shown below.



In TAMA, a “-CH<sub>2</sub>-O-R<sub>1</sub> (-R<sub>1</sub> is adamantyl)” group is bonded to the carbon atom at the α-position of the acrylate ester.

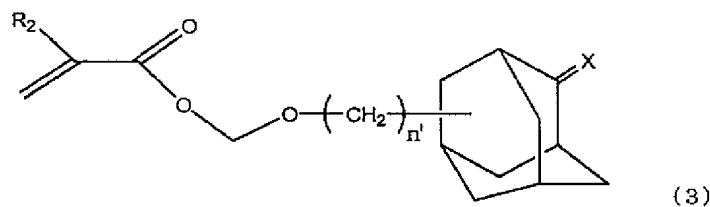
In contrast, in the polymer compound of present Claim 1, when the alkali soluble group (i) is a carboxyl group, the “-CH<sub>2</sub>-O-R<sub>1</sub>” group is bonded to the ester component of the acrylate ester as shown below.



( 19) (English specification, page 16)

Thus, the binding position of the “-CH<sub>2</sub>-O-R<sub>1</sub>” group in TAMA is different from the binding position of the “-CH<sub>2</sub>-O-R<sub>1</sub>” group of Claim 1. Therefore, since the structure of TAMA is different from the structure of the polymer compound of Claim 1, claims 1-3 , 5 and 6 cannot be anticipated by this reference.

Present claim 8 recites a compound represented by the following general formula (3):



(wherein R<sub>2</sub> represents the same as the aforementioned, X represents two hydrogen atoms or an oxygen atom, and n' represents 0 or 1.).

As noted above, Yoshida et al discloses TAMA. However, as described above, in TAMA, the “-CH<sub>2</sub>-O-R<sub>1</sub> (-R<sub>1</sub> is adamantly)” group is bonded to the carbon atom on the  $\alpha$ -position of acrylate esters. Thus, the structure of TAMA is different from the compound recited in present Claim 8. Thus, claim 8 and claim 10, which depends on claim 8, cannot be anticipated by this reference. Since claims 15-17 depend either directly or indirectly from claims which are not anticipated by this reference, they are also not anticipated.

The structure of TAMA disclosed by Yoshida et al. is also different from the structure recited in present claims 18 and 20 of the present application. Although a structural unit (C) of Yoshida et al contains a phenolic hydroxyl group, a leaving group R<sub>3</sub> of the structural unit (C) is different from the acid dissociable, dissolution inhibiting group (ii) of the present invention represented by the general formula (1). Thus, Yoshida et al. does not anticipate any of the presently pending claims.

**Park et al. (US2002/0177068)**

Claims 1, 2, 7, 9 and 15-17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Park et al. (US2002/0177068). Park et al. does not disclose that the cycloaliphatic group contains an adamantane backbone as recited in amended claim 1. This feature was originally recited in claim 4 (now canceled), which was not rejected as being anticipated by this reference. Thus, claims 1, 2, 7, 9 and 15-17 are not anticipated by Park et al.

Park et al. discloses methylnorbornanemethoxymethyl methacrylate as an alkoxyalkyl acrylate monomer. However, Park et al does not disclose the structure of the compound represented by formula (3) in present claim 8. Thus, claim 8 and claim 10, which depends on claim 8, cannot be anticipated by this reference. Since claims 15-17 depend either directly or indirectly from claims which are not anticipated by this reference, they are also not anticipated.

Park et al. also fails to anticipate claims 18 and 20. In the methylnorbornanemethoxymethyl methacrylate disclosed by Park et al., the alkali soluble group is a carboxyl group. Thus, Park et al. does not disclose the alcoholic hydroxyl group or phenolic hydroxyl group as the alkali soluble group (i) as recited in present claims 18 and 20.

In view of the comments provided above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(b),

**Ogata et al. (*J. Photopolymer Sci. Technol.* 17:483-488, 2004)**

Claims 1-4, 7-11 and 14 were rejected under 35 U.S.C. § 102(e) as being anticipated by Ogata et al. (*J. Photopolymer Sci. Technol.* 17:483-488, 2004).

Ogata et al. was published in June, 2004. The present application is the U.S. National Phase filing of PCT/JP2005/001228, filed on January 28, 2005, which claims priority to Japanese Patent Application No. 2004-134585, filed on April 28, 2004, which is prior to the date of the Ogata et al. reference. Enclosed herewith is a certified translation of JP 2004-134585. The disclosure of this certified translation is substantially the same as the present application, and all of the claims pending in the present application are fully supported by this certified translation. Thus, all of the presently pending claims are entitled to the April 28, 2004 priority date. Accordingly, Ogata et al. does not qualify as prior art against the present application.

In view of the comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(e).

Rejections under 35 U.S.C. § 103(a)

Claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Park et al. (US2002/0177068) in view of Hatakeyama et al. (US 2005/0004391). The Examiner alleges that it would have been obvious to include a hydrophilic group, such as a hydroxyl or carboxyl group, as taught by Hatakeyama, within the polymer compound as disclosed by Park to improve sensitivity, transparency and etching resistance. However, the combination of these references would not lead one having ordinary skill in the art to produce the presently claimed invention.

As discussed above, Park et al does not disclose (or suggest) that the cycloaliphatic group contains an adamantane backbone as recited in amended claim 1. This defect in the teaching of Park is not remedied by Hatakeyama et al. Thus, claim 5, which depends on claim 1, cannot be obvious over this combination of references. Since claim 6 depends on claim 5, it also cannot be obvious.

Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Park et al. in view of Uetani et al. (US 6,579,659). The Examiner alleges that it would have been obvious to include one or more lactone units and a polar group-containing polycyclic group as disclosed by Uetani et al. within the polymer composition of Park to improve adhesion,

resolution, sensitivity and etching resistance. However, present claim 11 depends on Claim 10, which recites a polymer compound comprising a structural unit (a1) derived from the compound of claim 8 and a structural unit (a3) derived from (meth)acrylate containing a lactone-containing monocyclic or polycyclic group. As described above, Park et al does not disclose the compound recited in present Claim 8. Thus, Park et al does not disclose or suggest the structural unit (a1) derived from the compound of Claim 8. This deficiency in the teaching of Park is not remedied by Uetani et al. Therefore, even if the polymer compound of Park et al is combined with the monomer containing one or more lactone units of Uetani et al, the polymer compound of Claim 11 would not be obtained. Since claim 11 is notobvious over this combination of references, then claims 12 and 13, which depended on Claim 11, are necessarily nonobvious.

New claims 19 and 21 are also nonobvious. These claims recite that the polymer compound contains a structural unit (a3) derived from (meth)acrylate containing a lactone-containing monocyclic or polycyclic group, wherein the structural unit (a3) comprises (meth)acrylate containing a lactone-containing monocyclic group and (meth)acrylate containing a lactone-containing polycyclic group represented by a structural formula (47).

Park et al does not disclose structural unit (a3). In addition, although Uetani et al recites a monomer containing one or more lactone units, the lactone-containing polycyclic group represented by the structural formula (47) is not disclosed by Uetani et al. Thus, even if the Park et al is combined with Uetani et al, the polymer compound recited in Claims 19 and 21 would not be obtained

Claim 22 depends on Claims 20 and 21. As described above, Claim 20 is neither anticipated by, nor rendered obvious by, Yoshida et al. and/or Park et al. Similarly, Claim 21 is neither anticipated by, nor obvious over Park et al and/or Uetani et al. Therefore, Claim 22 is also patentable over these references.

In view of the comments provided above, no *prima facie* showing of obviousness with respect to the presently pending claims has been established, and Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a)

#### **Unexpected results**

Even had a *prima facie* showing of obviousness been set forth, the presently claimed polymer compounds result in photoresist compositions have unexpected, beneficial properties,

which would rebut any such showing. For example, the polymer compound recited in present claim 1 constitutes a photoresist composition capable of having an excellent resolution, forming a fine pattern with a favorable rectangularity, obtaining favorable resist characteristics even when the acid strength of an acid generated from an acid generator is weak, and having favorable sensitivity.

In particular, R<sub>1</sub> in the acid dissociable, dissolution inhibiting group (ii) represented by the general formula (1) contains an adamantane backbone. By using the polymer compound recited in present Claim 1, a photoresist composition is obtained in which rectangularity, resolution, and sensitivity are favorable in the system of a chemically amplified positive resist, and favorable photoresist characteristics are expressed because an acid dissociable, dissolution inhibiting group can be dissociated by an acid generator generating a weak acid (specification at page 53, lines 10-16).

Examples 10, 13 and 18 of the present application, which use the claimed polymer compound, show that when PAG2: bis(2,4-dimethylphenylsulfonyl)diazomethane was used as an acid generator component, the resist patterns of line and space were obtained. In contrast, Comparative Examples 2 and 5 of the present application, which do not use a polymer compound within the scope of present claim 1, disclose that a resist pattern was not even resolved when PAG 2 was used as the acid generator component (specification at page 84, lines 3 to 5).

The alcoholic hydroxyl group recited in claim 18 has high transparency and appropriate alkali solubility (specification page 12, lines 6 to 7). In addition, Examples 1 to 3 (resins 7 to 9) which use the polymer compound within the scope of claim 18 disclose that a line and space pattern of 120 nm was obtained on 1:1 and that the pattern shape showed rectangularity, and exposure in this time was 14 to 15 mJ/cm<sup>2</sup>, and favorable sensitivity was obtained (specification at page 78, Table 3). These unexpected, beneficial advantages could not have been predicted based on any of the cited references, alone or in combination, and strongly support the nonobviousness of the present claims.

Appl. No.: 10/589,681  
Filed: August 16, 2006

CONCLUSION

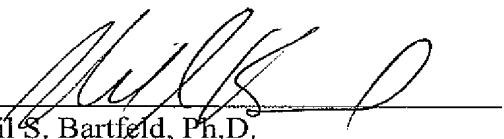
In view of the foregoing, the Applicants believe that the present application is fully in condition for allowance, and such action is earnestly solicited. Nevertheless, should the Examiner identify any impediments to the allowance of the application, the Examiner is encouraged to contact the undersigned by telephone in order to attempt to resolve any such impediments.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 9/23/08

By:   
Neil S. Bartfeld, Ph.D.  
Registration No. 39,901  
Agent of Record  
Customer No. 20,995  
(619) 235-8550

5941039  
091708